

Prevalence of pseudoexfoliation of the lens in Finns, Lapps, Icelanders, Eskimos, and Russians

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Lindberg (1917) discovered the disease which is now called pseudoexfoliation of the lens and its connection with open angle glaucoma. Since that time a great interest in capsular glaucoma has been taken in Finland, and many clinical and epidemiological studies have been presented (Tarkkanen, 1962; Vannas, 1969; Meretoja and Tarkkanen, 1977; Krause, personal communication), which shows the same high prevalence of pseudoexfoliation in different parts of the country.

The incidence of pseudoexfoliation varies widely in different countries. Even in the same country different authors have reported disparate figures; this is difficult to explain, because the condition should be easy to identify if the lens is clear. In our department the diagnosis of pseudoexfoliation is always made after dilatation of the pupil and biomicroscopy. In most cases a central disc is present as well as a peripheral band. The findings presented in this article have all been compiled by our own group and therefore comparable.

The prevalence of pseudoexfoliation in nine different populations is shown in Table I. The condition is sel-

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This work was done in collaboration with Dr. Svetlana Chehova of Novosibirsk, USSR.

dom seen before the age of 50, but after this the incidence increases rapidly. It is high in the Nordic countries and in Russia, but in Eskimos no case at all was found in Greenland, Alaska, or arctic Canada. Altogether 96 Eskimos of over 50 years of age were investigated. In 98 Skolt Lapps of comparable age seventeen cases of pseudoexfoliation were found. This difference is highly significant ($P < 0.01$). Lapps and Eskimos both live in the arctic at the same latitude and both have the same amount ocular changes due to the climate (Forsius, 1972). There thus seems to be a racial difference in the prevalence of pseudoexfoliation.

In 1977 I had the opportunity of studying the inmates and personnel of the State prison in Honolulu, Hawaii. No case of pseudoexfoliation was found, but the mean age was low, so that this study is not very important. The same can be said of two Fenno-Ugric population groups in Soviet Russia, the Cheremisses (Maris) and Ziryanians (Komis), which I also examined for other reasons.

The results of studies of persons over the age of 60 in four different ethnic groups are shown in Table II. The first study was made in Oulu, Finland, the second in the Åland Islands which ethnically belong to Sweden but are now a part of Finland geographically, the third in Iceland, and the fourth in Novosibirsk in the USSR. The

Table I Prevalence of pseudoexfoliation in nine populations, by age group

Population	Age group (yrs)									
	40-49		50-59		60-69		70-79		80-	
	No. of cases	Exfoliation	No. of cases	Exfoliation	No. of cases	Exfoliation	No. of cases	Exfoliation	No. of cases	Exfoliation
Finns, Oulu	—	—	—	—	50	5	108	23	62	20
Skolt Lapps	42	0	47	5	34	7	13	4	4	2
Åland Islands	—	—	17	4	85	9	67	14	54	16
Icelanders, Húsavík and Reykjavík	95	3	70	3	85	14	176	49	148	53
Hawaii, USA	38	0	12	0	3	0	—	—	—	—
Eskimos	53	0	46	0	36	0	13	0	1	0
Cheremisses, USSR	87	0	44	0	1	1	2	0	—	—
Ziryanians, USSR	110	1	37	2	17	4	5	2	—	—
Novosibirsk, USSR	1	0	68	6	75	13	62	14	8	1

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Table II Incidence of pseudoexfoliation in four different populations in persons above 60 years of age

Population	Cases of pseudoexfoliation					
	Male		Female		Total	Total cases examined
	Per cent	No.	Per cent	No.		
Oulu, Finland	21.4	21	22.1	27	48	220
Icelanders, Reykjavik	22.3	31	35.5	54	85	291
Åland Islands	13.3	13	24.1	26	39	206
Novosibirsk, USSR	16.2	11	9.1	7	18	145

study in Oulu was made in collaboration with Krause (Krause, 1973) and that in Åland was conducted by myself. The work in Iceland was partly published by Forsius, Sveinsson, Als, and Luukka (1974) and partly by Als (1979, in press). The investigations in Novosibirsk were performed by Forsius and Chehova in 1978; most of these patients were Russians, with a few Jews, Ukrainians, and Germans. Some persons who were being treated for glaucoma were included in all these studies as they formed part of the population, but they do not essentially change the results. The prevalence was highest in Iceland and lowest in the Åland Islands. On the other hand, the mean age (Table III) was in reverse order. Table I shows that the prevalence of pseudoexfoliation increases rapidly with age.

Table III Prevalence of pseudoexfoliation in four populations, by mean age

Population	Mean age (yrs)	Percentage with pseudoexfoliation	Total cases
Oulu, Finland	76	21.8	220
Icelanders, Reykjavik	78	29.2	291
Åland Islands	71	18.9	206
Novosibirsk, USSR	69	12.4	145

Studies in Finland (Krause, 1973) show that in young age groups glaucoma simplex is more common than capsular glaucoma, but in age groups above 70 years capsular glaucoma accounts for most cases (61.5 per cent) of open angle glaucoma. Even higher figures than this have been published from Norway (Hörven, 1936), giving 80 to 90 per cent pseudoexfoliation in glaucoma patients. Lower figures have also been found in Norway (Aasved, 1971) and in other countries.

During the winter of 1978-79, Dr. Chehova started to study the prevalence of pseudoexfoliation in glaucoma patients in Department of Ophthalmology, Town Hospital, Novosibirsk. Preliminary figures show that capsular glaucoma is very common among Russians

(Table IV). The frequency is low below 60 years of age, but after age 70 the majority of cases of open angle glaucoma also show pseudoexfoliation.

Table IV Prevalence of pseudoexfoliation in at least one eye in patients with open angle glaucoma in Novosibirsk, by age group

Age group (yrs)	No. with pseudoexfoliation	Total cases
40-49	1	2
50-59	1	10
60-69	15	33
70-79	37	55
80+	5	5
Total	59	105

Several authors (e.g. Aasved, 1971) have shown that capsular glaucoma is more deleterious than glaucoma simplex. This was so in Novosibirsk; see Table V. The patients are classified according to the severity of the disease.

Table V Prevalence of pseudoexfoliation in Novosibirsk, by severity of glaucoma

Severity of glaucoma	Pseudoexfoliation	
	Present	Absent
I	7	30
II	22	44
III	51	22
IV	13	9

In Gothenburg (Sweden) 35.6 per cent of all persons operated on for glaucoma showed the exfoliation syndrome (Jerndal, Hansson, and Bill, 1978). In Oulu 50 per cent of all patients (571 out of 1140) treated for glaucoma in the years 1973 to 1978 had pseudoexfoliation. In the years 1978 to 1979, trabeculectomy was performed in 79 cases of open angle glaucoma and in 38 the diagnosis was capsular glaucoma.

In most investigations, made by us or by other

authors, the prevalence of pseudoexfoliation was found to be higher in women than in men. I studied the prevalence of ocular changes due to climate in all the groups investigated. In all populations the males more often had pterygium, band-shaped climatic keratopathy, and a large pinguecula. Outdoor activity thus seems to have no effect on the formation of pseudoexfoliation. According to Als (personal communication, 1979) indoor workers in Iceland (mainly women) have significantly more pseudoexfoliation than the men.

We have also noted the colour of the iris in many of the populations studied, using Martin-Saller's iris colour scale. We found no correlation between iris colour and pseudoexfoliation in Lapps and Icelanders.

Some authors, including Aasved (1979), have found a familial occurrence of pseudoexfoliation. We have also noticed this but the mode of inheritance is difficult to identify because pseudoexfoliation is so common. There is no doubt, however, that there is a racial difference, which suggests a genetic factor in its development.

References

- AASVED, H. (1971) 'Fibrillographia epitheliocapsularis'. Thesis, University of Bergen
 — (1979) *Trans. ophthalm. Soc. U.K.*, **99**, 293
 ALS, E. (1979) 'Lens Exfoliation and Related Problems in Iceland'. Nordic Council for Arctic Medical Research (in press)
 FORSIUS, H. (1972) *Acta ophthalm. (Kbh.)*, **50**, 532
 —, SVEINSSON, K., ALS, E., and LUUKKA, H. (1974) *Ibid.*, **52**, 421
 HÖRVEN, E. (1936) *Ibid.*, **14**, 231
 JERNDAL, T., HANSSON, H. A., and BILL, A. (1978) 'Goniodysgenesis'. Scriptor, Copenhagen
 KRAUSE, U. (1973) *Acta ophthalm. (Kbh.)*, **51**, 235
 LINDBERG, J. G. (1917) 'Kliniska undersökningar över depigmenteringen av pupillranden, etc'. Thesis, Helsinki
 MERETOJA, J., and TARKKANEN, A. (1977) *Ophthalm. Res.*, **9**, 80.
 TARKKANEN, A. (1962) *Acta ophthalm. (Kbh.)* **40**, Suppl. 71
 VANNAS, A. (1969) *Ibid.*, **47**, Suppl. 105

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